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# A Review of the Fern Genus *Micropolypodium* (Grammitidaceae)

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**ABSTRACT.** *Micropolypodium* differs from other genera of Grammitidaceae in having segments or pinnae each with a single unbranched or 1-forked vein, erect rhizomes, linear fronds generally less than 1 cm wide, unisoriolate segments, and prominent hydathodes. About 30 species are known, most in tropical America and a few in eastern Asia. New combinations are made for the known species. A list of excluded names in *Xiphopteris*, in which most of the species have previously been placed, is provided.

Recent studies of grammitid ferns (Bishop, 1988, 1989; Smith et al., 1991; Smith & Moran, 1992; Parris, 1984, 1990) allude to the patent unnaturalness of traditional classifications of the Grammitidaceae, which have been based in large part on blade dissection. In an effort to arrive at a more natural classification of the family, studies initiated by Bishop and continued by Smith reveal that the genus *Micropolypodium*, established for a few Asian species, should be expanded to include many tropical American species heretofore placed variously in *Grammitis* (Morton, 1967), *Xiphopteris* (Copeland, 1952), and formerly *Polypodium* (Maxon, 1916). In lieu of a monographic treatment, which is needed especially for the South American species, and so that combinations are available for the forthcoming *Flora Mesoamericana*, I here provide a conspectus of *Micropolypodium* and make transfers of those species generally accepted in modern floristic accounts for Latin America (Proctor, 1977, 1985, 1989; Mickel & Beitel, 1988; Lellinger, 1989; Smith, 1981; Stolze, 1981). Following the transfers to *Micropolypodium*, I list all species that have been included within *Xiphopteris* and give their current taxonomic disposition, if known.

**Micropolypodium** Hayata, Bot. Mag. Tokyo 42: 341. 1928. TYPE: *Micropolypodium pseudotrichomanoides* (Hayata) Hayata, based on *Polypodium pseudotrichomanoides* Hayata [= *M. okuboi* (Yatabe) Hayata]. Figure 1A.

Plants usually epiphytic, rarely on rocks; rhizome radially symmetrical, suberect or erect, bearing golden, orangish, or yellow- to orange-brown, often lustrous, nonclathrate or weakly clathrate scales that

are entire, irregularly toothed, sparsely glandular, or setulose on the margin, setulae concolorous or often darker than scale body, cells of body often tumid; fronds monomorphic or nearly so, short-stipitate, with petioles 0.2–0.5 mm diam., not articulate to the rhizome; lamina linear, commonly 3–15(–25) cm long, usually less than 1(–1.2) cm wide, shallowly to usually deeply pinnatifid, pinnatisect, or barely pinnate, with usually numerous oblong to deltate, decurrent segments (pinnae), these sometimes with an acroscopic hump (segments gibbous); segments planar, basiscopic side not folded over sorus; laminar tissue chartaceous to subcoriaceous; veins simple or with only an acroscopic fertile vein branch, lacking a dark sclerenchymatous sheath except at the very base of the segment (not extending more than  $\frac{1}{10}$  the segment length); hydathodes present, round to clavate, usually conspicuous adaxially; setae often present on axes and lamina, these maroon to red-brown; hairs simple or often branched, mostly 0.1–0.5 mm long, multicellular with many short cells, at times glandular, hyaline with darkened cross-walls; sori round, superficial, one per pinna, usually adjacent to midrib at base of costa or on the acroscopic veinlet, borne along most of the blade length; paraphyses absent; sporangia glabrous.

The genus comprises about 30 species from southern Mexico to Bolivia and southern Brazil, and the Antilles; a few species occur in eastern Asia and Malesia (Japan, China, Sikkim, Philippines, New Guinea).

*Micropolypodium* differs from all other neotropical genera of Grammitidaceae by having segments (pinnae) with a single unbranched vein or with only an acroscopic branch (Figs. 1, 2A) and the segments often gibbous. Additional important (but not unique) characteristics are the radially symmetric erect rhizomes (Hayata 1928a, b, 1929), the often golden brown nonclathrate rhizome scales, linear fronds usually less than 10 mm wide and often less than 6 mm wide, unisoriolate segments (pinnae), prominent adaxial hydathodes (Figs. 1D, G, H, 2A), and the long, dark red-brown unbranched setae. The type is from eastern Asia, but by far the greatest diversity in the genus is in the Neotropics, with species most numerous and diverse in the West Indies and Central America.

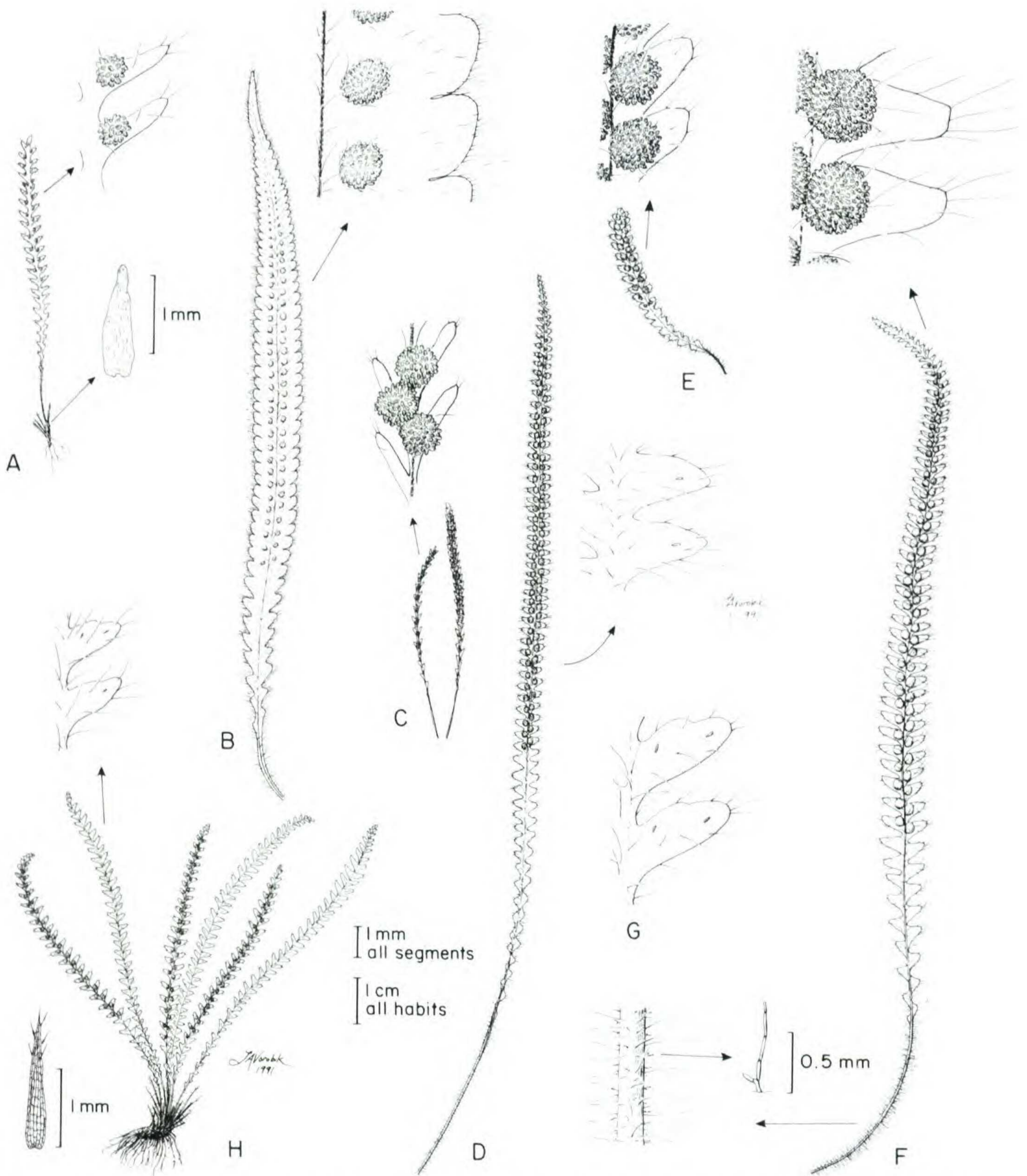


Figure 1. Representative species of *Micropolypodium*, habits and details of laminae, rhizome scales, and indument. —A. *M. okuboi* (Tagawa 8303, UC). —B. *M. truncicola* (Silverstone-Sopkin et al. 3605, UC). —C. *M. setosum* (Hatschbach 44998, UC). —D. *M. caucanum*, (Liesner 24841, UC). —E. *M. setulosum* (Stork 2336, UC). —F. *M. hyalinum* (Smith & Béliz 2081, UC). —G. *M. trichomanoides* (Williams et al. 41935, UC). —H. *M. nanum* (Moore et al. 9673, UC).

Thus defined, *Micropolypodium* seems homogeneous, without any readily apparent subgroups. I see no close affinities to any other neotropical or African genera of Grammitidaceae. The relationship of *Micropolypodium* to paleotropical genera, currently under study by Barbara Parris, is not apparent either. In the Old World, *Micropolypodium* may

be most similar to *Calymmodon*, a genus of about 25 mostly Malesian species but extending from Sri Lanka to Tahiti. *Calymmodon* agrees with *Micropolypodium* in having ascending, radially symmetric rhizomes, often golden brown rhizome scales, usually narrow laminae, nonarticulate stipes, absence of paraphyses, unbranched veins, adaxial hy-

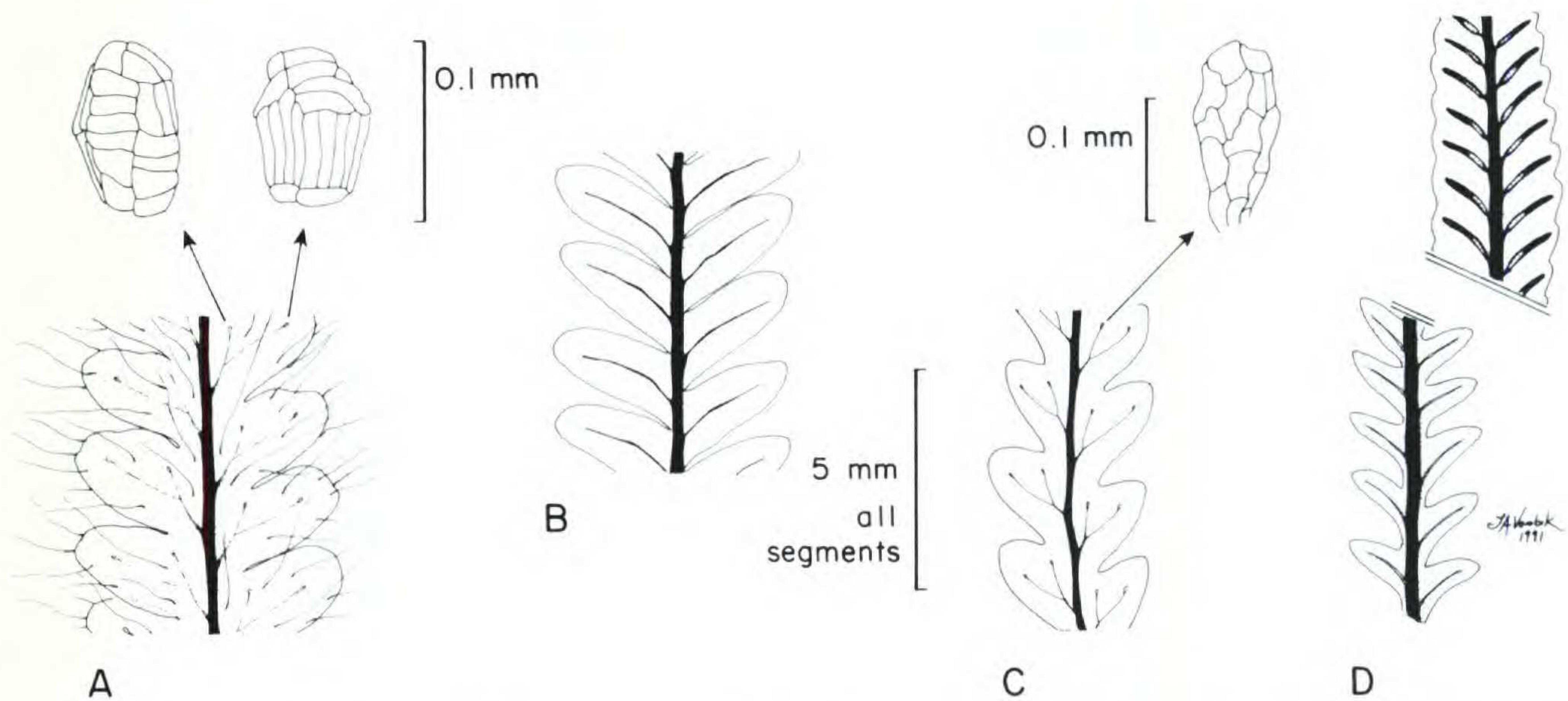


Figure 2. *Micropolypodium* and *Lellingeria* spp., details of venation and hydathodes. —A. *M. basiattenuata*, cleared lamina with details showing cellular pattern of hydathodes (Underwood 1452, US). —B. *Lellingeria hartii* (Jenman) A. R. Smith & R. C. Moran, cleared lamina (Stehlé 1473, US). —C. *Lellingeria schenckii* (Hieron.) A. R. Smith & R. C. Moran, cleared lamina with detail showing cellular pattern of hydathodes (Brade 6583, US). —D. *Lellingeria myosuroides* (Sw.) A. R. Smith & R. C. Moran, cleared lamina (Proctor 4363, US).

dathodes, and a single sorus per segment or pinna. *Calymmodon* differs in the usually whitish to pale red-brown setae on the axes and blades, often winged stipes, 1–5-branched hyaline hairs lacking darkened cross-walls on the hair branches, scales with 1(–2) hyaline seta(e) at the tip, sori often confined to the distal part of frond, thinner laminar tissue, and fertile segments with basispic side folded upwards to form a pouch for the sorus (see Parris, 1990, tab. 4000).

The similarities between species of *Micropolypodium* and some species of *Lellingeria* (Smith et al., 1991), particularly the *L. limula/myosuroides* group, in blade size and dissection are obvious, but the striking differences in rhizome scales indicate that the relationship is not a close one. These scale differences were noted many years ago by Maxon (1916: 542), who divided plants of this general form into two groups, based upon the differences in rhizome scales. Scales of *Micropolypodium* are usually golden to golden brown and concolorous; occasionally the lateral walls are slightly darker than the surface walls, and the scales might be described as subclathrate. However, they are never strongly clathrate to the degree found in *Lellingeria limula* or *Melpomene moniliformis* and their allies. Scale differences in Grammitidaceae have frequently been noted and used in descriptions and keys, but their significance in distinguishing large groups of species has not been realized until recently.

Another difference between the two genera is in the setae on the stipe and rachis, which are dark red-brown and simple in *Micropolypodium* but usually whitish or hyaline, often branched, and generally

much shorter in *Lellingeria*. Narrow-bladed species of *Lellingeria* (*L. myosuroides* group) usually have dark sclerenchymatous tissue covering the veins (Fig. 2B–D). These red-brown cells extend most of the length of the vein to the hydathode and are best seen in cleared fronds. Species of *Micropolypodium* generally lack darkened costae, or the sclerenchyma of the rachis extends less than 0.5 mm as rudimentary branches at the base of the segments (Fig. 2A).

Hydathodes in most species of *Micropolypodium* are among the most prominent of any genus in the family. The cell pattern on the surface of the hydathodes, as seen in cleared fronds, is strikingly dissimilar to the epidermal cell pattern, with many cells rather elongate (Fig. 2A). Although this character has not yet been studied in detail, most other hydathodous grammitid genera (e.g., *Lellingeria*) appear to have the cells of the hydathode more nearly isodiametric, smaller, and less obviously different from epidermal cells (Fig. 2C).

The setae in *Micropolypodium* also appear to differ from those of many other grammitid genera. A ring of cells, different from the surrounding epidermal cells, radiates from the base of the seta in *M. basiattenuata* and in several other species of *Micropolypodium* examined. This specialized cell pattern at the base of the setae has not been detected in preliminary surveys of other grammitid genera.

Only a few chromosome counts have been reported for species belonging to *Micropolypodium*. Walker (1985) counted  $2n = 74$  for *M. taenifolium* (as *Grammitis taenifolia*) from Trinidad. Silva Ar-

aujo (1976) reported  $2n = ca. 36$  for *M. trichomanoides* (as *Grammitis trichomanoides*) from near Manaus, Brazil. The voucher (not seen) is probably misidentified and from the locality may be *M. nanum*, which is the only species of *Micropolypodium* known from near Manaus. A base number of  $x = 37$  is known in most other genera of Grammitidaceae, e.g., *Enterosora*, *Ceradenia*, and *Melpomene*. In *Lellingeria*, base numbers of  $x = 32$  and  $33$  are so far known (see Smith et al., 1991), and these numbers suggest an additional difference between *Micropolypodium* and *Lellingeria*.

## AMERICAN SPECIES

- Micropolypodium aphelolepis*** (C. Morton) A. R. Smith, comb. nov. Basionym: *Grammitis aphelolepis* C. Morton, Contr. U.S. Natl. Herb. 38: 97. 1967. *Xiphopteris aphelolepis* (C. Morton) Pichi-Serm. Distribution: Ecuador.
- Micropolypodium basiattenuatum*** (Jenman) A. R. Smith, comb. nov. Basionym: *Polypodium basiattenuatum* Jenman, Bull. Bot. Dept. Jamaica, n.s. 4: 114. 1897. *Grammitis basiattenuata* (Jenman) Proctor. *Xiphopteris basiattenuata* (Jenman) Copel. Distribution: Jamaica, southern Mexico, Guatemala, Honduras.
- Micropolypodium blepharideum*** (Copel.) A. R. Smith, comb. nov. Basionym: *Polypodium blepharideum* Copel., Univ. Calif. Publ. Bot. 19: 304, pl. 64. 1941. *Xiphopteris blepharidea* (Copel.) Copel. Distribution: Peru.
- Micropolypodium caucanum*** (Hieron.) A. R. Smith, comb. nov. Basionym: *Polypodium caucanum* Hieron., Bot. Jahrb. Syst. 34: 503. 1904. *Grammitis caucana* (Hieron.) C. Morton. *Xiphopteris caucana* (Hieron.) Copel. Distribution: Costa Rica to Ecuador and Venezuela. Figure 1D.
- Micropolypodium cookii*** (L. Underw. & Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium cookii* L. Underw. & Maxon, Contr. U.S. Natl. Herb. 17: 408. 1914. *Grammitis cookii* (L. Underw. & Maxon) F. Seymour. *Xiphopteris cookii* (L. Underw. & Maxon) Copel. Distribution: Guatemala to Costa Rica.
- Micropolypodium grisebachii*** (L. Underw. ex C. Chr.) A. R. Smith, comb. nov. Basionym: *Polypodium grisebachii* L. Underw. ex C. Chr., Index Filic. 531. 1906, based on *Polypodium exiguum* Griseb., Fl. Br. W. Ind. 701. 1864, non Heward, 1838. *Grammitis grisebachii* (L. Underw. ex C. Chr.) Proctor. *Xiphopteris grisebachii* (L. Underw. ex C. Chr.) Copel. Distribution: Jamaica, Lesser Antilles.
- Micropolypodium hyalinum*** (Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium hyalinum* Maxon, Contr. U.S. Natl. Herb. 17: 406. 1913. *Grammitis hyalina* (Maxon) F. Seymour. *Xiphopteris hyalina* (Maxon) Copel. Distribution: Costa Rica, Panama, Ecuador. Figure 1F.
- Micropolypodium knowltoniorum*** (Hodge) A. R. Smith, comb. nov. Basionym: *Polypodium knowltoniorum* Hodge, Amer. Fern J. 31: 105, t. 1, figs. 4–6. 1941. *Grammitis knowltoniorum* (Hodge) Proctor. *Xiphopteris knowltoniorum* (Hodge) Copel. Distribution: Lesser Antilles.
- Micropolypodium liesneri*** (A. R. Smith) A. R. Smith, comb. nov. Basionym: *Grammitis liesneri* A. R. Smith, Ann. Missouri Bot. Gard. 77: 257. 1990. Distribution: eastern Venezuela.
- Micropolypodium nanum*** (Fée) A. R. Smith, comb. nov. Basionym: *Polypodium nanum* Fée, Gen. Filic. 238. 1852. *Grammitis blanchetii* (C. Chr.) A. R. Smith. *Polypodium blanchetii* C. Chr. *Xiphopteris nana* (Fée) Copel. Distribution: Venezuela, Guianas, Colombia, Amazonian Brazil. Figure 1H.
- Micropolypodium nimbatum*** (Jenman) A. R. Smith, comb. nov. Basionym: *Polypodium nimbatum* Jenman, J. Bot. 24: 271. 1886. *Grammitis nimbata* (Jenman) Proctor. *Xiphopteris nimbata* (Jenman) Copel. Distribution: Cuba, Jamaica, Hispaniola; U.S.A. (disjunct in Macon Co., North Carolina).
- Micropolypodium perpusillum*** (Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium perpusillum* Maxon, Contr. U.S. Natl. Herb. 17: 409. 1913. *Xiphopteris perpusilla* (Maxon) Copel. Distribution: Brazil (Minas Gerais).
- Micropolypodium plicatum*** (A. R. Smith) A. R. Smith, comb. nov. Basionym: *Grammitis plicata* A. R. Smith, Ann. Missouri Bot. Gard. 77: 258. 1990. Distribution: eastern Venezuela.
- Micropolypodium pulogense*** (Copel.) A. R. Smith, comb. nov. Basionym: *Polypodium pulogense* Copel., Philipp. J. Sci. 6: 148. 1911. *Xiphopteris pulogensis* (Copel.) Copel. Distribution: Philippines.
- Micropolypodium serricula*** (Fée) A. R. Smith, comb. nov. Basionym: *Polypodium serricula* Fée, Gen. Fil. 238. 1852. *Grammitis serricula* (Fée) Proctor. *Xiphopteris serricula* (Fée) Copel. Distribution: Lesser Antilles.
- Micropolypodium setosum*** (Kaulf.) A. R. Smith, comb. nov. Basionym: *Xiphopteris setosa* Kaulf., Enum. Filic. 275. 1824. *Grammitis setosa* (Kaulf.) C. Presl, non Blume, 1828.

*Polypodium micropteris* C. Chr. Distribution: southern Brazil. Figure 1C.

**Micropolypodium setulosum** (Rosenstock) A. R. Smith, comb. nov. Basionym: *Polypodium setulosum* Rosenstock, Repert. Sp. Nov. Regni Veg. 10: 277. 1912. *Grammitis setulosa* (Rosenstock) F. Seymour. *Xiphopteris setulosa* (Rosenstock) Copel. Distribution: Costa Rica, Panama. Figure 1E.

**Micropolypodium sherringii** (Baker) A. R. Smith, comb. nov. Basionym: *Polypodium sherringii* Baker in Jenman, J. Bot. 20: 26. 1882. *Grammitis sherringii* (Baker) Proctor. *Xiphopteris sherringii* (Baker) Copel. Distribution: Cuba, Jamaica.

**Micropolypodium taenifolium** (Jenman) A. R. Smith, comb. nov. Basionym: *Polypodium taenifolium* Jenman, Bull. Bot. Dept. Jamaica, n.s. 4: 114. 1897. *Grammitis blepharodes* (Maxon) F. Seymour. *Grammitis taenifolia* (Jenman) Proctor. *Polypodium blepharodes* Maxon. *Xiphopteris blepharodes* (Maxon) Copel. *Xiphopteris taenifolia* (Jenman) Copel. Distribution: Antilles, northern South America.

**Micropolypodium trichomanoides** (Sw.) A. R. Smith, comb. nov. Basionym: *Polypodium trichomanoides* Sw., Prodr. 131. 1788. *Grammitis trichomanoides* (Sw.) Ching. *Xiphopteris trichomanoides* (Sw.) Copel. Distribution: Cuba, Jamaica, southern Mexico, Guatemala, Venezuela. Figure 1G.

**Micropolypodium truncicola** (Klotzsch) A. R. Smith, comb. nov. Basionym: *Polypodium truncicola* Klotzsch, Linnaea 20: 374. 1847. *Grammitis truncicola* (Klotzsch) C. Morton. *Polypodium andinum* Hook. *Xiphopteris truncicola* (Klotzsch) Copel. Distribution: Costa Rica to Venezuela and Peru. Figure 1B.

**Micropolypodium williamsii** (Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium williamsii* Maxon, Contr. U.S. Natl. Herb. 17: 547, pl. 34. 1916. *Grammitis williamsii* (Maxon) Lellinger. *Xiphopteris williamsii* (Maxon) Copel. Distribution: Bolivia.

**Micropolypodium zurquinum** (Copel.) A. R. Smith, comb. nov. Basionym: *Xiphopteris zurquina* Copel., Amer. Fern J. 42: 99. 1952. *Grammitis zurquina* (Copel.) F. Seymour. Distribution: Costa Rica.

The following names (listed alphabetically by basionym) clearly apply to species of *Micropolypodium*, but until monographic or floristic work can be undertaken in their area of occurrence, their status (whether synonyms or good species) is unclear. They are not likely to supersede any of the combinations made above.

*Polypodium basale* Maxon, Amer. Fern J. 52: 110.

1962. *Grammitis basalis* (Maxon) Lellinger. Distribution: Ecuador. This species was omitted by Morton (1967).

*Polypodium blepharolepis* C. Chr., Index Fil. Suppl. 1: 58. 1913. *Grammitis blepharolepis* (C. Chr.) C. Morton. *Xiphopteris blepharolepis* (C. Chr.) Copel. Distribution: Ecuador, Peru.

*Polypodium buesii* Maxon, Contr. Gray Herb. 165: 72. 1947. *Grammitis buesii* (Maxon) Lellinger. *Xiphopteris buesii* (Maxon) Copel. Distribution: Peru.

*Polypodium daguense* Hieron., Bot. Jahrb. Syst. 34: 504. 1904. *Grammitis daguensis* (Hieron.) C. Morton. *Xiphopteris daguensis* (Hieron.) Copel. Distribution: Colombia.

*Polypodium gibbosum* Fée, Mém. Foug. 6: 8, pl. 2, f. 2. 1854. This species was said by Fée to be from Mexico, probably erroneously.

*Polypodium gracillimum* Hieron., Hedwigia 48: 250. 1909, non Copel., 1905. = *P. blepharolepis* C. Chr.

*Polypodium pseudotrichomanoides* Hayata, Icon. Fl. Formosa 4: 251, f. 176. 1914. *Micropolypodium pseudotrichomanoides* (Hayata) Hayata, Bot. Mag. (Tokyo) 42: 341. 1928. Distribution: Taiwan. This species is probably conspecific with *Micropolypodium okuboi*.

*Polypodium pullei* Alston, J. Bot. 78: 229. 1940. Distribution: New Guinea. This is possibly a synonym of *Micropolypodium pulgense* (Parris, in litt.).

*Polypodium sikkimense* Hieron., Hedwigia 44: 97. 1905. *Xiphopteris sikkimensis* (Hieron.) Copel. Distribution: Sikkim.

*Xiphopteris killipii* Copel., Amer. Fern J. 42: 105. 1952. *Grammitis killipii* (Copel.) Lellinger. Distribution: Colombia.

#### EXCLUDED NEW WORLD SPECIES

The following New World species of *Xiphopteris* (or *Grammitis*) historically have been thought to be closely allied by Copeland (1952) and others with species here included in *Micropolypodium*. Their combinations in *Xiphopteris* (or *Grammitis*, if no combination has been made in *Xiphopteris*), together with their taxonomic disposition, are given in alphabetical order:

*Grammitis anamorphosa* Proctor = *Lellingeria anamorphosa* (Proctor) A. R. Smith & R. C. Moran

*Grammitis nutata* (Jenman) Proctor = *Lellingeria nutata* (Jenman) A. R. Smith & R. C. Moran

*Grammitis pseudomitchellae* Lellinger = *Lellingeria pseudomitchellae* (Lellinger) A. R. Smith & R. C. Moran

*Grammitis ruglessii* Proctor = *Lellingeria ruglessii* (Proctor) A. R. Smith & R. C. Moran

*Xiphopteris allosuroides* (Rosenstock) Crabbe = *Melpomene allosuroides* (Rosenstock) A. R. Smith & R. C. Moran

*Xiphopteris amphidasyon* (Kunze ex Mett.) Alston = "Terpsichore"

*Xiphopteris apiculata* (Kunze ex Klotzsch) Copel. = *Lellingeria apiculata* (Kunze ex Klotzsch) A. R. Smith & R. C. Moran

*Xiphopteris aromatica* (Maxon) Crabbe = *Melpomene firma* (J. Smith) A. R. Smith & R. C. Moran

*Xiphopteris auyantepuiensis* Vareschi = *Cochlidium serrulatum* (Sw.) L. E. Bishop

*Xiphopteris capillaris* (Desv.) Crabbe = *Ceradenia capillaris* (Desv.) L. E. Bishop

*Xiphopteris choquetangensis* (Rosenstock) Crabbe = *Pecluma choquetangensis* (Rosenstock) M. G. Price

*Xiphopteris cultrata* (Bory ex Willd.) Schelpe = "Terpsichore"

*Xiphopteris delitescens* (Maxon) Copel. = *Lellingeria delitescens* (Maxon) A. R. Smith & R. C. Moran

*Xiphopteris extensa* Fée = *Cochlidium serrulatum* (Sw.) L. E. Bishop

*Xiphopteris flabelliformis* (Poiret) Schelpe = *Melpomene flabelliformis* (Poiret) A. R. Smith & R. C. Moran

*Xiphopteris hartii* (Jenman) Copel. = *Lellingeria hartii* (Jenman) A. R. Smith & R. C. Moran

*Xiphopteris heteromorpha* (Hook. & Grev.) Crabbe = "Terpsichore"

*Xiphopteris jamesonii* Hook. = *Lellingeria myosuroides* (Sw.) A. R. Smith & R. C. Moran

*Xiphopteris lanigera* (Desv.) Crabbe = "Terpsichore"

*Xiphopteris limula* (Christ) Pichi-Serm. = *Lellingeria limula* (Christ) A. R. Smith & R. C. Moran

*Xiphopteris longa* (C. Chr.) Alston = "Terpsichore"

*Xiphopteris luetzelburgii* (Rosenstock) Brade = *Lellingeria wittingiana* (Fée) A. R. Smith & R. C. Moran?

*Xiphopteris mitchellae* (Baker ex Hemsley) Copel. = *Lellingeria mitchellae* (Baker ex Hemsl.) A. R. Smith & R. C. Moran

*Xiphopteris moniliformis* (Lagasca ex Sw.) Crabbe = *Melpomene moniliformis* (Lagasca ex Sw.) A. R. Smith & R. C. Moran

*Xiphopteris mortonii* Copel., Amer. Fern J. 42: 97. 1952. = *Lellingeria*

*Xiphopteris myosuroides* (Sw.) Kaulf. = *Lellingeria myosuroides* (Sw.) A. R. Smith & R. C. Moran

*Xiphopteris myriophylla* (Mett.) Crabbe = "Terpsichore"

*Xiphopteris organensis* (Gardner) Copel. = *Lellingeria organensis* (Gardner) A. R. Smith & R. C. Moran

*Xiphopteris peruviana* (Desv.) Crabbe = *Melpomene peruviana* (Desv.) A. R. Smith & R. C. Moran

*Xiphopteris pilosissima* (M. Martens & Galeotti) Crabbe = *Melpomene pilosissima* (M. Martens & Galeotti) A. R. Smith & R. C. Moran

*Xiphopteris pozuzoënsis* (Baker) Crabbe = *Ceradenia pilipes* (Hook.) L. E. Bishop

*Xiphopteris reitzii* Alston = *Lellingeria*

*Xiphopteris schenckii* (Hieron.) Copel. = *Lellingeria schenckii* (Hieron.) A. R. Smith & R. C. Moran

*Xiphopteris serrulata* (Sw.) Kaulf. = *Cochlidium serrulatum* (Sw.) L. E. Bishop

*Xiphopteris shaferi* (Maxon) Kramer = *Lellingeria shaferi* (Maxon) A. R. Smith & R. C. Moran

*Xiphopteris skutchii* (Maxon) Copel. = *Lellingeria myosuroides* (Sw.) A. R. Smith & R. C. Moran

*Xiphopteris sodiroi* (Christ & Rosenstock) Crabbe = *Melpomene sodiroi* (Christ & Rosenstock) A. R. Smith & R. C. Moran

*Xiphopteris strictissima* (Hook.) Vareschi = *Lellingeria myosuroides* (Sw.) A. R. Smith & L. E. Bishop

*Xiphopteris subscabra* (Klotzsch) Crabbe = *Polypodium subscabrum* Klotzsch (see Stolze, 1991)

*Xiphopteris wittingiana* (Fée) Brade = *Lellingeria wittingiana* (Fée) A. R. Smith & R. C. Moran

*Xiphopteris yungensis* (Rosenstock) Crabbe = "Terpsichore"

*Xiphopteris antipodalis* Copel.

*Xiphopteris apoensis* (Copel.) Copel.

*Xiphopteris ascensionensis* (Hieron.) Cronk = *Lellingeria*

*Xiphopteris bryophylla* (v.A.v.R.) Parris = *X. musgraviana* (see Parris, 1986)

*Xiphopteris conjunctisora* (Baker) Copel. = *Grammitis*? (see Parris, 1983)

*Xiphopteris cornigera* (Baker) Copel. (see Parris, 1986)

*Xiphopteris cucullata* (Nees & Blume) Sprengel = *Calymmodon cucullatus* (Nees & Blume) C. Presl

*Xiphopteris elastica* (Bory ex Willd.) Alston = "Terpsichore"

*Xiphopteris exilis* Parris (see Parris, 1986)

*Xiphopteris glandulosopilosa* (Brause) Copel. = *X. musgraviana* (see Parris, 1986)

*Xiphopteris govidjoaensis* (Brause) Copel.

*Xiphopteris hecistophylla* (Copel.) Copel.

*Xiphopteris heterophylla* Sprengel = *Grammitis*? (see Parris, 1984)

*Xiphopteris hieronymusii* (C. Chr.) Holttum. *Polypodium sertularioides* J. Smith ex Hieron. (non Baker, 1876). = *X. cornigera*

*Xiphopteris hildebrandtii* (Hieron.) Tard. = *Lellingeria hildebrandtii* (Hieron.) A. R. Smith & R. C. Moran

*Xiphopteris khaoluangensis* Tag. & Iwatsuki = *X. cornigera*? (Parris, in litt.)

*Xiphopteris murudensis* (Copel.) Copel.

*Xiphopteris musgraviana* (Baker) Parris (see Parris, 1986)

*Xiphopteris oosora* (Baker) Alston = *Lellingeria oosora* (Baker) A. R. Smith & R. C. Moran

*Xiphopteris orientalis* (Desv.) Fourn. = *Cochlidium serrulatum* (Sw.) L. E. Bishop

*Xiphopteris punctata* (Ballard) Alston = *Ceradenia pruinosa* (Maxon) L. E. Bishop

*Xiphopteris rigescens* (Bory ex Willd.) Alston = *Melpomene flabelliformis* (Poiret) A. R. Smith & R. C. Moran

*Xiphopteris saffordii* (Maxon) Copel. = *Lellingeria saffordii* (Maxon) A. R. Smith & R. C. Moran

*Xiphopteris setulifera* (v.A.v.R.) Parris = *Polypodium pumilum* Brause (non Cockayne, 1909) (see Parris, 1986)

*Xiphopteris sparsopilosa* (Holttum) Holttum (see Parris, 1986)

*Xiphopteris strangeana* Pichi-Serm. = *Lellingeria strangeana* (Pichi-Serm.) A. R. Smith & R. C. Moran

*Xiphopteris subcoriacea* (Copel.) Copel. = *Lellingeria subcoriacea* (Copel.) A. R. Smith & R. C. Moran

*Xiphopteris subpinnatifida* (Blume) Copel. (see Parris, 1986)

*Xiphopteris villosissima* (Hook.) Alston = *Zygophlebia villosissima* (Hook.) L. E. Bishop

*Xiphopteris zenkeri* (Hieron.) Schelpe = *Ctenopteris zenkeri* (Hieron.) Tard.

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#### EXCLUDED OLD WORLD SPECIES OF *XIPHOPTERIS*

*Xiphopteris aethiopica* Pichi-Serm. = *Lellingeria aethiopica* (Pichi-Serm.) A. R. Smith & R. C. Moran

*Xiphopteris albobrunnea* (Baker) Schelpe

*Xiphopteris alternidens* (Cesati) Copel. (see Parris, 1986)

#### Literature Cited

- Bishop, L. E. 1988. *Ceradenia*, a new genus of Grammitidaceae. Amer. Fern J. 78: 1-5.  
 ———. 1989. *Zygophlebia*, a new genus of Grammitidaceae. Amer. Fern J. 79: 103-118.

- Copeland, E. B. 1952. The American species of *Xiphopteris*. Amer. Fern J. 42: 41-52, 93-110.
- Hayata, B. 1928a. On the systematic importance of the stelar system in the Filicales, II. Bot. Mag. Tokyo 42: 301-311.
- . 1928b. On the systematic importance of the stelar system in the Filicales, III. Bot. Mag. Tokyo 42: 334-348.
- . 1929. Über die systematische Bedeutung des stelären Systemes in den Polypodiaceen. Flora 124: 38-62 + 2 pl.
- Lellinger, D. B. 1989. The ferns and fern-allies of Costa Rica, Panama, and the Chocó (Part 1). Pteridologia 2A: 1-364.
- Maxon, W. R. 1916. Studies of tropical American ferns—No. 6. Contr. U.S. Natl. Herb. 17: 541-608.
- Mickel, J. T. & J. M. Beitel. 1988. Pteridophyte flora of Oaxaca, Mexico. Mem. New York Bot. Gard. 46: 1-568.
- Morton, C. V. 1967. The genus *Grammitis* in Ecuador. Contr. U.S. Natl. Herb. 38: 85-123.
- Parris, B. S. 1983. A taxonomic revision of the genus *Grammitis* Swartz (Grammitidaceae: Filicales) in New Guinea. Blumea 29: 13-222.
- . 1984. Another intergeneric hybrid in Grammitidaceae: *Ctenopteris longiceps* × *Grammitis sumatrana*. Fern Gaz. 12: 337-340.
- . 1986. Grammitidaceae of peninsular Malaysia and Singapore. Kew Bull. 41: 491-517.
- . 1990. Noteworthy species of Grammitidaceae from South-east Asia. Hooker's Icon. Pl. 40(4): 1-129 + i-iv.
- Proctor, G. R. 1977. Pteridophyta. Pp. 1-414 in R. A. Howard (editor), Flora of the Lesser Antilles, vol. 2. Arnold Arboretum, Jamaica Plain, Massachusetts.
- . 1985. Ferns of Jamaica. British Museum (Natural History), London.
- . 1989. Ferns of Puerto Rico and the Virgin Islands. Mem. New York Bot. Gard. 53: 1-389.
- Silva Araujo, I. J. 1976. In: IOPB chromosome number reports LIII. Taxon 25: 483-500.
- Smith, A. R. 1981. Pteridophytes. Pp. 1-370 in D. E. Breedlove (editor), Flora of Chiapas, Part 2. California Academy of Sciences, San Francisco.
- & R. C. Moran. 1992. *Melpomene*, a new genus of Grammitidaceae (Pteridophyta). Novon 2: 426-432.
- , ——— & L. E. Bishop. 1991. *Lellingeria*, a new genus of Grammitidaceae. Amer. Fern J. 81: 76-88.
- Stolze, R. G. 1981. Fern and fern allies of Guatemala. Part 2: Polypodiaceae. Fieldiana, Bot. n.s. 6: 1-522.
- . 1991. The identity of *Polypodium subsca-brum* Klotzsch. Amer. Fern J. 81: 139-140.
- Walker, T. G. 1985. Cytotaxonomic studies of the ferns of Trinidad. 2. The cytology and taxonomic implications. Bull. Brit. Mus. (Nat. Hist.), Bot. 13: 149-249.